Study to evaluate post operative drop in serum albumin as a marker for surgical stress and predictor for clinical outcome in laparatomy patients

Surgical interventions trigger a metabolic stress response of varying magnitude which contributes to complications, delayed recovery and prolonged hospital stay. A number of preoperative interventions allow modulating an excessive stress response, some of them having an important positive impact on clinical outcome. Therefore, a trustworthy forecast of the surgical stress response is of high interest. The ideal marker has to be easy to measure, available early in the preoperative course, and economical. It should be robustly correlated with the extent of surgical trauma and be a reliable predictor of complications and prolonged hospital stay. So far, no such parameter is available. Albumin, the most abundant protein in humans, is widely used as a nutritional marker and an outcome predictor. Albumin also shows an instantaneous response to surgical tension and could, therefore, meet the criteria to determine surgical stress and to predict a complicated postoperative course. The present study aims to assess serum albumin levels as response marker for surgical stress and as a predictor of adverse outcomes. A prospective study was done for nine months of cases undergoing laparotomy both electively and in an emergency between the age

group of 16 to 70 years. Serum albumin (g/L) levels were measured in preoperative period in a homogeneous manner as per the hospital technical guidelines. Blood samples on Post Operative Day were taken 4–6 hours postoperatively. Subsequently, daily albumin level was monitored up to POD – 5. Complications after surgery were graded by use of validated Dindo-Clavien system; grades I-II were measured as minor and III-IV were measured as major complications, respectively. Mortality was documented as grade V. Hospital stay was counted from the day of surgery. Preoperative and postoperative albumin levels were measured for the patients and correlation between the post-op fall in albumin level was compared with the incidence of post-op complications as determined by Dindo-Clavien scoring. Following results were obtained. The age distribution of the participants was with a mean age of 45 (S.D=15.905). Majority of them were males (60%, n=30). The Dindo-Clavien Scoring of the patients showed that 19 of them were in grade I. The duration of the stay was a mean of 8.32 days (S.D=4.468) for 47 patients while two of them died on 10^{th}post-operative day and one of them on 12^{th}post-operative day. A repetitive measures ANOVA with a Greenhouse-Geisser correction determined

that mean serum albumin differed statistically significantly between time points (F (2.321, 113.750) = 69.895, P < 0.0005). In this study, the fall in serum albumin levels was related to the magnitude of surgery and the surgical stress associated with it. Clinical outcomes were also related to the postoperative albumin levels. Future studies should be focussed on correlating the results from multi-site, multi-city studies to prove albumin as a reliable indicator of post operative surgical stress. Translating these findings into decision making protocols for therapeutic procedures is important.

Key words: Surgical Stress, Dindo-Clavien Scoring, India, Abdominal Surgery, Albumin